WHAT IS CLAIMED IS:

1. A valve train system of an internal combustion engine, comprising:

a lift amount changing mechanism that changes a lift amount of an intake valve;

a determining device that determines an existence of an effect of improving a fuel consumption by increasing a compression ratio of a combustion chamber on the basis of an operation state of the internal combustion engine; and

a compression ratio increasing device that increases a compression ratio of the combustion chamber by opening and subsequently closing an exhaust valve after an intake stroke until a pressure within the combustion chamber becomes equal to a pressure within an exhaust passage when it is determined that there is the effect of improving the fuel consumption.

2. The valve train system according to claim 1, wherein the determining device determines the existence of the effect of improving the fuel consumption by increasing the compression ratio of the combustion chamber on the basis of at least one of a required torque, a load rate, an opening-closing timing of the intake valve, and an air-fuel ratio of an air-fuel mixture within the combustion chamber.

3. The valve train system according to claim 1, wherein a valve-closing timing of the exhaust valve is defined by at least one of an engine speed and a required torque, the lift amount and a valve-closing timing of the intake valve at a moment before a valve-opening timing of the exhaust valve, and the pressure within the combustion chamber.

4. The valve train system according to claim 1, wherein a lift amount of the exhaust valve is defined by at least one of an engine speed and a required torque, the lift amount and a valve-closing timing of the intake valve at a moment before the valve-opening timing of the exhaust valve, and the pressure within the combustion chamber.

5. A valve train system of an internal combustion engine, comprising:

a lift amount changing mechanism that changes a lift amount of an intake valve;

a determining device that determines an existence of an effect of improving a fuel consumption by admitting exhaust gas in a stratified state into a combustion chamber on the basis of an operation state of the internal combustion engine; and

an exhaust gas introducing device that serves to admit the exhaust gas in the stratified state into the combustion chamber when it is determined that there is the effect of improving the fuel consumption.

6. The valve train system according to claim 5, wherein the exhaust gas introducing device serves to open and subsequently close an exhaust valve after an intake stroke until a pressure within the combustion chamber becomes equal to a pressure within an exhaust passage so as to admit the exhaust gas in the stratified state into the combustion chamber.

7. The valve train system according to claim 6, wherein a valve-closing timing of the exhaust valve is defined by at least one of an engine speed and a required torque, the lift amount and a valve-closing timing of the intake valve at a moment before a valve-opening timing of the exhaust valve, and the pressure within the combustion chamber.

8. The valve train system according to claim 6, wherein a lift amount of the exhaust valve is defined by at least one of quantity of the exhaust gas discharged from the combustion chamber and a temperature of an exhaust gas purifying catalyst disposed in the exhaust passage, an engine speed and a required torque, the lift amount and a valve-closing timing of the intake valve at a moment before a valve-opening timing of the exhaust valve, and the pressure within the combustion chamber.

9. A control method of a valve train system of an internal combustion engine, for changing a lift of an intake valve, the control method comprising the steps of:

determining an existence of an effect of improving a fuel consumption by increasing a compression ratio of a combustion chamber on the basis of an operation state of the internal combustion engine; and

when it is determined that there is the effect of improving the fuel consumption, increasing the compression ratio of the combustion chamber by opening and subsequently closing an exhaust valve after an intake stroke until a pressure within the combustion chamber becomes equal to a pressure within an exhaust passage.

10. A control method of a valve train system of an internal combustion engine, for changing a lift amount of an intake valve, the control method comprising the steps of:

determining an existence of an effect of improving a fuel consumption by admitting exhaust gas in a stratified state into a combustion chamber on the basis of an operation state of the internal combustion engine; and

when it is determined that there is the effect of improving the fuel consumption, serving to admit the exhaust gas in the stratified state into the combustion chamber.